

WE CLAIM:

1. An apparatus for automated sectioning of a tissue specimen, comprising:
a cutting tool electrically biased with respect to the tissue specimen;
a tissue holder having means for holding the tissue specimen on said tissue holder;
a cooling bath containing a cooling liquid for submerging the tissue specimen during sectioning; and
means for moving said cutting tool whereby said cutting tool passes through the tissue specimen in a selected plane so as to separate sections of tissue from the tissue specimen by electro-dissociation.
2. The apparatus of claim 1, wherein said means for moving said cutting tool comprises a horizontal translation stage for moving said cutting tool in a horizontal plane, a vertical translation stage for moving the tissue specimen in a vertical direction, and computer means for controlling the motion of the horizontal translation stage and the vertical translation stage.
3. The apparatus of claim 1, wherein said cutting tool is a wire.
4. The apparatus of claim 1, wherein said cutting tool is a multi-layered blade.
5. The apparatus of claim 4, wherein said multi-layered blade comprises a central electrode having a leading edge, a layer of insulating material covering said central electrode except for said leading edge, said layer of insulating material formed into a cutting shape adjacent to said leading edge, and a layer of thermally and

electrically conductive material covering said insulating material except adjacent to said leading edge.

6. The apparatus of claim 1 further comprising means for stirring said cooling liquid in said cooling bath.

7. An apparatus for automated sectioning of a tissue specimen, comprising:
a cutting tool operatively connected to a radio frequency (RF) generator;
a tissue holder having means for holding the tissue specimen on said tissue holder, said tissue holder being operatively connected to said RF generator;
a cooling bath containing a cooling liquid for submerging the tissue sampling during sectioning; and

means for moving said cutting tool whereby said cutting tool passes through the tissue specimen in a selected plane so as to separate sections of tissue from the tissue specimen by electro-dissociation.

8. The apparatus of claim 7, wherein said means for moving said cutting tool comprises a horizontal translation stage for moving said cutting tool in a horizontal plane, a vertical translation stage for moving the tissue specimen in a vertical direction, and computer means for controlling the motion of the horizontal translation stage and the vertical translation stage.

9. The apparatus of claim 7, wherein said cutting tool is a wire.

10. The apparatus of claim 7, wherein said cutting tool is a multi-layered blade.

11. The apparatus of claim 10, wherein said multi-layered blade comprises a central electrode having a leading edge, a layer of insulating material covering said

central electrode except for said leading edge, said layer of insulating material formed into a cutting shape adjacent to said leading edge, and a layer of thermally and electrically conductive material covering said insulating material except adjacent to said leading edge.

12. The apparatus of claim 8 further comprising means for stirring said cooling liquid in said cooling bath.

13. A method of separating a tissue section from a tissue sample by electro-dissociation, comprising the steps of:

- (a) providing a cutter biased electrically with respect to the tissue sample;
- (b) submerging the tissue sample in a cooling bath comprising a cooling liquid; and
- (c) passing said cutter through the bulk tissue sample in a defined plane to separate a tissue section from the tissue sample by electro-dissociation.

14. The method of claim 13 further comprising the step of stirring said cooling liquid in said cooling bath.